**ABSTRACT**

A method of subdividing a representation of an object surface comprising a tessellated mesh of polygons is provided. The surface may be bounded by one or more boundary curves. One or more polygons in the mesh may be each subdivided into child polygons, each having one or more vertices. The result is a second mesh representation which may have a finer level of resolution than the original mesh. The locations or parameters of the vertices of the child polygons in the second mesh may be determined using suitable weightings of the locations or parameters of adjacent vertices in the original mesh. The locations of the vertices in the second mesh may be further refined through application of detail vectors. The locations of boundary vertices are always constrained to lie on one of the boundary curves bounding the surface in question. The method may continue iterating until the surface as represented by the subdivided surface representation is fine enough for the intended application.